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Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

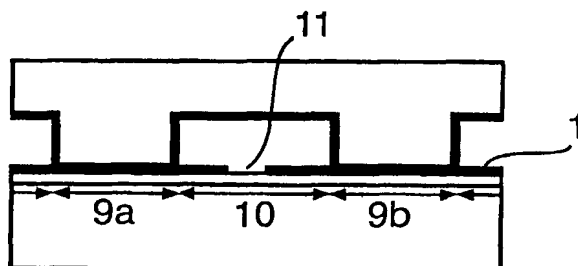
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(88) Date of publication of the international search report:
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MICRO-CONTACT PRINTING METHOD



(57) Abstract: The invention relates to micro-contact printing, wherein a self-assembled monolayer (SAM)-forming molecular species (1) is applied to a surface (2) of an article (3). The SAM-forming species (1) comprise a polar functional group that is exposed when the species (1) form a monolayer. This enables said printing method to be performed in vacuum or in a gaseous atmosphere, preferably in air. The invention also relates to an article having a surface comprising at least one isolated region of a SAM having a lateral dimension within the range of from 1 to 100 nm. Furthermore, the invention relates to a method for producing at least one nanowire, or a grid of nanowires, having a lateral dimension within the range of from 1 to 100 nm.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 03/03060

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G03F7/00 B05D1/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G03F B05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, COMPENDEX, WPI Data, INSPEC, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	"FABRICATION OF GOLD NANOSTRUCTURES BY LITHOGRAPHY WITH SELF-ASSEMBLED MONOLAYERS" IBM TECHNICAL DISCLOSURE BULLETIN, IBM CORP. NEW YORK, US, vol. 39, no. 12, 1 December 1996 (1996-12-01), pages 235-238, XP000686075 ISSN: 0018-8689	8, 13
A	the whole document ----- -/--	9

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

26 April 2004

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Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 03/03060

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	HUANG J ET AL: "Photopatterning of self-assembled alkanethiolate monolayers on gold. A simple monolayer photoresist utilizing aqueous chemistry" LANGMUIR; LANGMUIR MAR 1994, vol. 10, no. 3, March 1994 (1994-03), pages 626-628, XP002278004 the whole document	9
Y	GUCKEL K ET AL: "Fabrication of assembled micromechanical components via deep X-ray lithography" PROCEEDINGS OF THE WORKSHOP ON MICRO ELECTRO MECHANICAL SYSTEMS. INVESTIGATION OF MICRO STRUCTURES, SENSORS, ACTUATORS, MACHINES AND ROBOTS. NARA, JP., JAN. 30 - FEB. 2, 1991, NEW YORK, IEEE, US, vol. WORKSHOP 4, 30 January 1991 (1991-01-30), pages 74-79, XP010039609 ISBN: 0-87942-641-1 the whole document	9
A	YOUNAN XIA ET AL: "USE OF CONTROLLED REACTIVE SPREADING OF LIQUID ALKANETHIOL ON THE SURFACE OF GOLD TO MODIFY THE SIZE OF FEATURES PRODUCED BY MICROCONTACT PRINTING" JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, DC, US, vol. 117, no. 11, 22 March 1995 (1995-03-22), pages 3274-3275, XP000573923 ISSN: 0002-7863 the whole document	1
A	E. DELAMARCHE ET AL.: "POSITIVE MICROCONTACT PRINTING" JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, DC, US, vol. 124, no. 15, 21 March 2002 (2002-03-21), pages 3834-3835, XP002278005 ISSN: 0002-7863 cited in the application the whole document	2
A	US 6 413 587 B1 (ABBOTT NICHOLAS ET AL) 2 July 2002 (2002-07-02)	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 03/03060

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7,10-12

microcontact printing methods for applying self-assembled monolayers involving controlled spreading of the monolayers,

2. claims: 8,9,13

method for producing nanowires using narrow (1-100nm) monolayer patterns as etch mask,.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 03/03060

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 6413587	B1	02-07-2002	US 2002071943 A1	13-06-2002